

Rhodora

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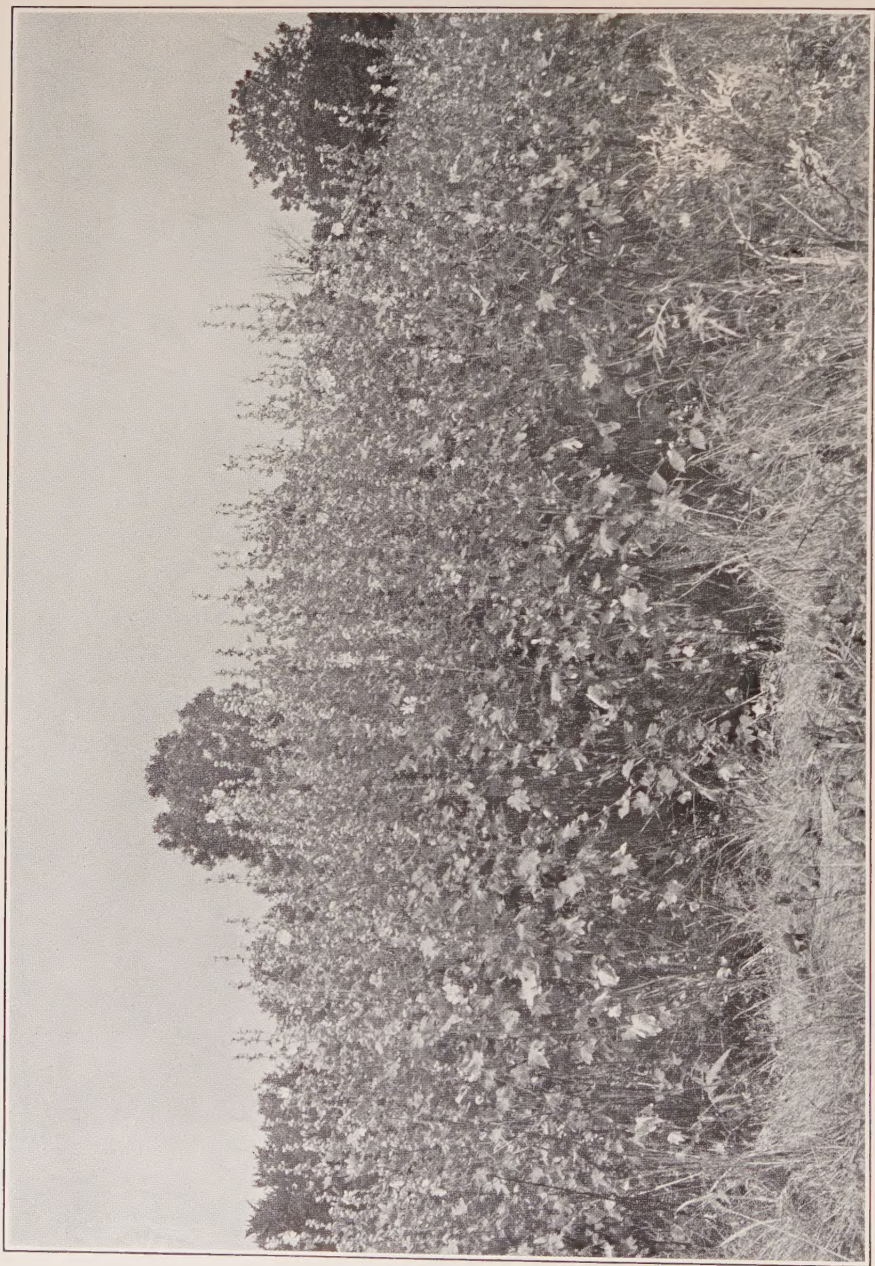
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One of the larger colonies of *ILIAMNA REMOTA* var. *TYPICA* on Altorf Island (photograph by author, July 28, 1945).

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NOTES ON CERTAIN PLANTS IN THE GRAY'S MANUAL RANGE

EARL EDWARD SHERFF

Plates 1021-1024

ILIAMNA REMOTA Greene, Leaflets Bot. Crit. 1: 206. 1906.—It is now more than eighteen years since this rare species, theretofore known only from an island in the Kankakee River (at Altorf, about nine miles northwest of Kankakee, Illinois), was discovered growing on Peters Mountain in Virginia. Strausbaugh & Core, in an early volume of RHODORA (34: 142. 1932), have presented, under the synonym *Phymosia remota* (Greene) Britton, an interesting account of its discovery at the latter habitat. Their paper was followed closely by another, entitled "*Phymosia remota* in captivity" (S. C. Wadmond, *op. cit.* 207). Both of these papers were so stimulating to lovers of our rarer plant species that it has seemed worth while to supplement them with certain additional notes and remarks.

Rev. E. J. Hill, who collected the first herbarium material June 29, 1872, was at that time a teacher in the Kankakee High School.¹ Apparently he did not realize for some years the importance of his find. It became referred to *Sphaeralcea acerifolia* Nutt. in Asa Gray's Synoptical Flora (1: 317. 1897). On August 1, 1899, Dr. Edward L. Greene revisited the exact locality where Mr. Hill had collected in 1872 and obtained more specimens. He later assigned them to his new genus *Iliamna*, in which he erected for them the new species *I. remota*. His cited

¹ For a good account of his long and fruitful life, see Mrs. Agnes Chase's article, with plate, RHODORA 19: 61-69. 1917.

herbarium specimens were all of his own collecting (none by Hill), so of course the type specimen would be a plant by Greene.²

In 1908, Fernald, RHODORA 10: 52, renamed Greene's Kankakee plant *Sphaeralcea remota*.

In 1912, Dr. N. L. Britton was concluding his revisional work upon Britton & Brown's Illustrated Flora (edit. 2) and wished to secure an ampler assortment of specimens of the Kankakee plant. He wrote to the authorities of Field Museum of Natural History (now the Chicago Natural History Museum) for aid. Dr. Jesse M. Greenman, then of that institution, accordingly undertook to journey to the type locality. The elderly Mr. Hill, then in his seventy-ninth year, and myself were invited to accompany him. Arriving in the forenoon of August 3rd at Altorf, just northeast of the island's upper end, we forded the river at a point somewhat upstream, using a horse-drawn carriage. Securing a boat on the opposite shore, we rowed to the southwestern shore of the island and anchored. We were led presently by Mr. Hill with surprising directness and accuracy to the very spot where he remembered having collected some forty years before. The plants of *Iliamna remota*—to use Greene's original name unmodified—were numerous and both Dr. Greenman and myself secured a few herbarium specimens (Greenman 3530, Sherff 1600) and ripe seeds for Dr. Britton's studies, also for distribution to various herbaria.³ It may be added here that Britton published the new combination *Phymosia remota* the following year (Britton & Brown *loc. cit.* 2: 522), and that, since then, several authors, among them Strausbaugh & Core (*loc. cit.*), have accepted Britton's name.

For some years before his death (in 1923), Dr. C. F. Millspaugh, the Curator of Botany in those days at Field Museum of Natural History, was keenly interested in the rare Kankakee plant (*cf.*

² Greene's description of the island's position as "some twelve or fifteen miles above the city of Kankakee" was inexact. The island was indeed "just opposite a small village [or what may once have been a village] called Altorf" as added by him, but the distance by road on either side of the Kankakee River measures roughly nine miles from the business center (particularly the courthouse) in Kankakee.

³ Dr. Isaac Bayley Balfour, Regius Keeper of the Royal Botanic Garden at Edinburgh, was among those sent some of the seeds. He wrote me perhaps three years later that the seeds had been planted on the grounds of his institution and had resulted in large, beautiful, flowering specimens that seemed well established. (Those who attempt to germinate seeds of this species might well scarify them first, between pieces of emory paper, or else soak them for 24 hours before planting, as mentioned in the above cited paper by Wadmond.)



One of the many smaller colonies of *ILIAMNA REMOTA* var. *TYPICA* on Altorf Island (photograph by author, July 28, 1945).

Wadmond, *loc. cit.*). In 1916, on his suggestion, Mr. O. E. Lansing, Jr., of Field Museum, and myself were commissioned to make botanical trips to certain Illinois localities of special interest,⁴ among them that on the Kankakee island. At this last locality we collected numerous specimens of *Iliamna remota* (Lansing & Sherff 8, on rocky, grassy slope at Altorf Island, Aug. 23), supplementing these with a liberal quantity of mature seeds. Returning to Kankakee, we were graciously escorted by the late Judge Arthur W. De Selm to his residence and shown a number of fine flowering and fruiting specimens of *I. remota* growing in his garden. These he had raised from seed personally obtained in the type locality several years before.

Shortly afterward, Clute (*Amer. Botanist* 26: 127–129. 1920), writing under the caption, "The rarest American plant," told of finding, after long and what seemed destined to be an unsuccessful search in the type locality, "a single plant of the rare mallow." He removed this plant to his private grounds, where it grew vigorously. Reading further: "We secured an abundance of seeds and hope by another year to have done something toward modifying its rarity." Strausbaugh & Core (*op. cit.* 146) cited Clute's paper and stated that, if his observation was correct, "it must then be apparent that the Virginia station is now the only known place in the world where *Phymosia remota* [*i. e.*, *Iliamna remota* Greene] is growing as a wild plant, and since there are at the present time not more than 50 plants at this station the species must be regarded as an exceedingly rare one that may soon become extinct."

The experience recorded by Clute seemed to my mind somewhat astonishing. In 1912 and again in 1916 I had observed that the more elevated, flat, level stretch of land on the Kankakee island (sometimes called Altorf Island) was cultivated as a corn field. The *Iliamna* plants were found beginning at the edge of the corn field and extending a few meters down the more or less steep and wooded slope leading to the river. They were, we may say, in a narrow belt of open-woods habitat. Since this narrow belt was below where a plough would ever strike, it had seemed logical to assume that even with continued cultivation of the

⁴ It is a curious coincidence that one of these trips was described by me in the very issue of *RHODORA* containing Mrs. Chase's biographic sketch of Mr. E. J. Hill (vol. 19, April, 1917; see pp. 74 & 75).

plateau-like field adjacent to this foothold they would be able to persist.

Deciding at last to see for myself how *Iliamna remota* had fared on the Kankakee island, I made a return visit on July 23rd, 1945, to the type locality.⁵ To my great delight, I found that farming had been abandoned and that there were several hundreds of *Iliamna* plants flourishing there. From a distance, they displayed in several places a massed effect and, in general habit, somewhat suggested hollyhocks. A good proportion were robust, several-stemmed, 1-1.7 meters tall, and abundantly flowered. The majority were on the open, level expanse of the island, where they may indeed have become re-established subsequent to a one-time cultivation. A fair proportion, however, were on the upper part of the marginal rocky, grassy slope where I had seen them in earlier years.⁶ At the time of day the plants were visited (one to two hours before true noon) the temperature was above 90° F. and the sunlight very bright. The flowers were fully expanded, although Wadmond reported (*op. cit.* 209) that on cloudy days the flowers never opened fully. Some five dozen herbarium specimens were obtained (my no. 5021) for distribution to herbaria later on and one small living plant removed for my garden. The specimens were kept for more than four hours slightly moistened in a closed, standard-sized, metal household clothes-boiler, then put in a plant press. Their flowers had remained fully expanded meanwhile.

On the 28th of the same month, I returned to the type habitat, in company with Dr. G. S. Daston of the Chicago Natural History Museum. Photographs of the growing plants were taken (PLATES 1021 and 1022), two more plants were dug up for removal to my garden (where all three plants are now safely established), ripe seeds were obtained, and further observations were made. These may be given briefly: The soil was not gravelly as had been reported, but distinctly a brown, sandy clay.

⁵ This time alone. Those who would visit this spot, if not good oarsmen, should have preferably a companion along. The river, while usually only 3 to 15 dm. deep in July and August, is very swift and has many treacherous currents, making progress uncertain and difficult.

⁶ It seems likely that Clute and his companions who visited the island in 1920 went to the wrong part of it. The older plants have remarkably long, thick, mostly horizontal roots and on the grassy, unmolested slope there seems little reason why the plants should have appeared successively in 1872, 1912, and 1916, then vanished by 1920, and finally become established again by 1945.



ILIAMNA REMOTA var. *TYPICA* from *Sherff* 5021, type locality on Altorf Island, July 23, 1945 (photograph by author from specimen in Gray Herb.).

In open, level situations colonies were up to 5 meters or more across, and essentially a pure stand (pl. 1021), the individual stems not tending to sprawl as they did where plants were growing singly at the edge of the treeless plateau, on grassy slopes in partial shade. Commonly the plants were accompanied by the darkened and dead stems of the previous year (these show clearly in pl. 1022). Leaves nearly always had a broadly triangular terminal lobe, this widening regularly from apex to base and being subtended by wide, obtuse sinuses. A few plants had some leaves, especially on their branches, with terminal lobe oblong or subcuneately narrowed below and subtended with sharp sinuses, as shown in Strausbaugh & Core's plate for a Virginia plant. Some plants had numerous suberect, straightish, axillary branches \pm 2 dm. long, but for most plants these were undeveloped or absent. The flowers had a very pleasing but delicate fragrance (indeed, the dried specimens after a lapse of three months are strikingly fragrant). The larger flowers measured easily 5 cm. in diameter. The petals were irregularly more or less emarginate and usually very inequilateral, with one terminal lobe much exceeding the other.

In 1936, Wiggins published "A Resurrection and Revision of The Genus *Iliamna* Greene" (Contrib. Dudley Herb. Stanford Univ. 1: 211-230, pl. 20). Many data, references, and considerations advanced by him as being germane to a proper understanding of *Iliamna remota* and its congeners must be omitted here. I have been constrained, however, to follow Wiggins in taking up Greene's name *Iliamna remota* for the Kankakee plant, which, for more precise handling, may be known as var. **typica** (var. nov.)⁷. With the Kankakee plant, Wiggins merged the Virginia form, as indeed had been done by Strausbaugh & Core (*vide*

⁷ Since preparing the text for this paper, I have learned of the recent remarkable discovery by Dr. S. W. Witmer of Goshen College, of the var. *typica* in Elkhart County, northern Indiana. Professor Witmer has very kindly sent me two specimens for examination and granted permission to announce his discovery. Under date of Nov. 23, 1945, he wrote: "One of these specimens I collected July 4, 1944, the day I discovered this species growing wild at the station to be mentioned below. The other specimen I collected from the same station on Aug. 28, 1945.

"These plants were found 2 miles east of New Paris, Elkhart County, Indiana, at a point where the Wabash R. R. crosses the Elkhart River. I located four colonies of these plants over a stretch of ground extending about 430 yards from the river eastward along the north side of the railroad right-of-way. The four colonies included about 73 more or less distinct clumps. On the latter date of collection many of the plants had grown between 5 and 6 feet tall."

supra). However, the Virginia plant was known to be montane in its habitat, while the var. *typica* had been thought of as a prairie plant. Thus, for example, Gleason, writing some years ago on the vegetational history of the middle-western United States (Annals Assoc. Amer. Geographers 12: 39-85. 1922) mentioned "*Phymosia remota*" in particular as one of certain plants participating in the eastward advance of our prairies and therefore being "accompanied or followed by some specific evolution." "These plants," he added, "are now confined to the eastern arm of the Prairie Province but in each case have their nearest related species much farther west."

Suspecting that the Virginia plant might be distinct, I visited the Peters Mountain locality at Narrows, Virginia, in August, 1945, but was unable to locate a single specimen. Later, through the very kind aid of Mr. Henry H. L. Smith, Principal of the Narrows High School, the friendly and generous cooperation of Mr. James Hubert Browning, one of his Senior students, was enlisted. Mr. Browning instituted a fresh search upon Peters Mountain and within a week's time succeeded in finding, at an altitude of "900 feet above New River", *i. e.*, at about 2400 feet above sea-level, two plants. Six leaves and an abundance of ripe fruits were sent me for record purposes. The habitat was described as at Narrows.

Meanwhile, through the good offices of my warm personal friend, Dr. P. D. Strausbaugh, of West Virginia University, the further assistance of Dr. Earl L. Core of the same institution and of Dr. E. Meade McNeill of Concord College, Athens, West Virginia, was obtained. Indeed, it happened that Dr. Core, who was the actual discoverer of the Peters Mountain *Iliamna* in 1927, had ascended Peters Mountain as recently as the month before my own fruitless ascent, but during the time at his disposal was unable to find any specimens. That *Iliamna* might still be found, however, was thoroughly believed by Dr. McNeill who, on taking a class up Peters Mountain some nine years earlier, had found a colony of more than a hundred plants. Professor McNeill volunteered to revisit the mountain in an attempt to rediscover specimens. This he did with two companions shortly afterwards. Without much difficulty they finally came upon an area a few rods long, containing numerous individuals and small

clumps or even colonies. Early in October, 1945, spurred on by the enthusiasm and the zealous efforts put forth by Professor McNeill in my behalf, I visited Narrows once again and on Oct. 5th, in his company, ascended Peters Mountain to the newly discovered site. Specimens were obtained for our gardens, also for distribution to herbaria (McNeill & Sherff no. 1). Our ascent was made at a point 0.9 mile down (*i. e.*, north and north-west along) the highway (as measured, in the automobile, from the northeast end of the New River bridge at Narrows) along New River. We went up eastwardly and somewhat northwardly. Our plants grew at the very crest of the rocky ridge or shoulder of the mountain, the altitude being about 2500 feet (no specimens were found at 2000 feet, the altitude reported originally by Strausbaugh & Core)⁸. The habitat was of the open-woods type, with numerous shrubs and small or stunted trees such as *Crataegus*, and naturally permitted wind and light an easy access. The soil in the various patches of earth, often mere pockets in the rock, was a very black humus and when wet (as it was at the time of our ascent) appeared identical with the muck often encountered in swamp or marsh habitats of our prairie states. The plants all were in or just past their late fruiting state. In stature, they were much smaller than in var. *typica* of the Kankakee habitat. Their height was mostly 6–9 dm., not mostly 1–1.7 m. as in var. *typica*⁹. The leaves had blades seldom 1 dm. (and very rarely 1.25 dm.) broad or long, while in var. *typica* leaf-blades 1.5 dm. or more in length and breadth are common. Some specimens could be found with terminal leaf-lobe as described above for most leaves of var. *typica*, but the majority of leaves were as shown in Strausbaugh & Core's illustration (*loc. cit.*, fig. 1) and had the terminal lobe oblong or subcuneately narrowed below and subtended with sharp sinuses (see pl. 1024).¹⁰

⁸ On my abortive trip in August I made extensive searches at levels of from 1900 to 2300 feet. Numerous outcropping rocks were observed, as described by Strausbaugh and Core for the habitat, but seemingly the habitat had been altered since their time because of heavy forest-cutting and subsequent reforestation. This change was remarked upon likewise by Core when he ascended in July.

⁹ Strausbaugh and Core in their "description of the Virginia plant" gave the height as "0.6–2 m. tall, or taller," but neither Dr. McNeill nor I could find any plants appreciably over a meter tall.

¹⁰ The terminal lobe is especially apt to be widened at or slightly below the middle, much as in some material of *Iliamna latibracteata* Wiggins of the western United States.

A subsequent examination of additional herbarium specimens from Peters Mountain, collected there by Fogg and by Sharp (and very kindly lent me by Dr. J. M. Greenman, Curator of the Herbarium of the Missouri Botanical Garden), has been made but no constant differences have been found in flowers or fruits. It appears that the Peters Mountain plants (*vide* pl. 1024) are specifically identical with the Kankakee plants (*vide* pl. 1023) but varietally distinct. I have named them after Dr. Earl L. Core who, as a member of the West Virginia University Botanical Expedition in 1927, discovered the first specimens:

ILIAMNA REMOTA var. **Corei**, var. nov.—A varietate *typica* plantis humilioribus plerumque sub 1 m. altis foliis minoribus plerumque sub 1 dm. latis et lamina sub 1 dm. longis lobo terminali saepius oblongo vel infra subcuneate angustato et sinibus plus minusve acribus subtento differt.

SPECIMENS EXAMINED: *James Hubert Browning*, at 900 feet above New River, end of Peters Mt., in Narrows, Virginia, September, 1945 (two plants found; leaves and fruits in Chi. Nat. Hist. Mus.); *John M. Fogg, Jr.*, 15047, alt. 3000 feet, on dry, wooded, rocky shoulder of Peters Mt., along New River north of Narrows, Jul. 17, 1938 (Mo. Bot. Gard.); *McNeill & Sherff* 1, in black humus or muck, among rocks at top of ridge, alt. about 2500 feet, Peters Mt., Narrows, Oct. 5, 1945 (TYPE, Gray Herb.: ISOTYPES, Carnegie Mus., 2 sheets; Chi. Nat. Hist. Mus.; Cornell Univ.; Delessert Herb.; Gray Herb.; Kew Bot. Gard.; McNeill Herb. in Concord Coll.; Univ. Minnesota; Mo. Bot. Gard.; N. Y. Bot. Gard., 2 sheets; Mus. Nat. Hist. Paris; Phila. Acad. Nat. Sci., 2 sheets; Stanford Univ., 2 sheets; U. S. Nat. Mus., 2 sheets; West Virginia Univ.); *Aaron J. Sharp*, on rocky exposure of Peters Mt., Narrows of New River, June 29, 1940 (Mo. Bot. Gard., 2 sheets); *West Virginia University Bot. Exped.*, Peters Mt., The Narrows (Carn. Mus.; N. Y. Bot. Gard., where dated Jul. 20, 1929).

VALERIANELLA CHENOPODIFOLIA (Pursh) DC.—Deam (Fl. Indiana 890. 1940) cites definitely or positively a single locality in Indiana for this species, namely Studebaker's woods, St. Joseph County, where it was collected by Nieuwland in 1912 and again in 1919. For the past five years I have noted specimens growing at certain spots in bottom-land or flood-plain woods along Trail Creek, just south of U. S. Highway 20 and perhaps two miles southeast of Michigan City. One stand, covering a quarter of an acre or more near the bridge at a small cross-road,



ILIAMNA REMOTA var. *COREI* from *McNeill & Sherff* 1, alt. about 2500 feet, Peters Mt. at Narrows, October 5, 1945 (photograph by author from TYPE in Gray Herb.).

was so dense as to resemble somewhat a field of buckwheat (*Fagopyrum esculentum* Moench) in flower. Numerous specimens (my no. 5020, May 13, 1945) have been distributed to the larger herbaria.

MONARDA FISTULOSA var. TYPICA f. ALBESCENS Farw.—This white-flowered forma I have already noted elsewhere (Torreya 45: 68. 1945) as occurring on a shady bank along South Broadway Road, near Hastings, Michigan, in the summer of 1944. Several dozen flowering stems were counted in the same spot, Aug. 5, 1945. Nowhere was there evident an intergradation with the typical purplish- or lavender-flowered form that abounded near by. Specimens were collected (my no. 5022) for distribution to the larger herbaria.

VERBASCUM PHLOMOIDES L.—Deam (Fl. Indiana 834. 1940) notes the recent discovery (about 1925) of *V. Phlomoides* in Indiana, at a place near Burnettsville. He cites several additional localities where he himself found it. I have kept no records but have observed it at several points along highways, in old pastures and near fences, in central and northwestern Indiana, in August, 1945, and north of Chicago Heights, Illinois, in September, 1945. Pennell (Scroph. E. Temp. N. Amer., Acad. Nat. Sc. Phila. Monogr. 1: 173. 1935) gives Minnesota as the northwesternmost state for its range in the United States. In July of 1945, I chanced upon a locality in Michigan where it was the dominant or at least most conspicuous species for many acres of ground. This was an old field (D. McCallum farm) just north of the Pine Lake in the northwest quarter of Hope Township, Barry County. Specimens (my no. 5023) were collected on Aug. 6th for distribution to herbaria. Descriptions in manuals were read and compared with the actual specimens in the field. It became at once obvious that some authors had relied for measurements and other details all too much upon herbarium specimens. For *Verbascum Phlomoides* these are apt, in many respects, to be misleading.¹¹ The larger plants do not make herbarium specimens readily, because of their gigantic leaves

¹¹ Cf. Britton & Brown, Illustr. Fl. edit. 2. 3: 174. 1913. Here the flowers are said to be "usually in a solitary elongated spike-like raceme." Yet in practically all of the larger plants there are several racemes arising from below the principal or central one. Indeed, it is because of the characteristic *candelabrum* effect thus produced that *V. Phlomoides* can so often be told at a considerable distance from the ubiquitous *V. Thapsus* L.

and their large multiple inflorescences. Consequently the collector turns to the smaller, more tractable plants for making specimens.

From the living plants the following notes were taken: Larger plants \pm 2 meters tall and having the principal raceme 7.5–9.3 dm. long; often 12 or more long, erect branches from *at* to a few cm. *below* base of principal raceme and having a raceme \pm 0.5 as long as principal one. Principal lower leaves (excluding basal ones) on these larger plants often 4.5–5 dm. long. The acuminate tip of the median and upper leaves is usually a conspicuous feature.

CENTAUREA MACULOSA Lam.—In 1908, Gray's New Manual (edit. 7) gave (p. 861) New England to New Jersey as the range for *C. maculosa* in the United States. Deam more recently (Fl. Indiana 1104. 1940) gave its range as extending west to Michigan, Wisconsin, and Minnesota. For Indiana he was reluctant to admit the species as being well enough established to deserve listing. In adjacent southern Michigan, however, I have seen several small colonies during the past four years and these all seemed thoroughly established, especially so in Barry County and at a country spot near Howell. My no. 5025 was collected in quantity near a fence in a hay field, one half mile east of Leach Lake, northeast of Hastings, Aug. 8, 1945.

CHICAGO TEACHERS COLLEGE and CHICAGO NATURAL
HISTORY MUSEUM.

BOTANICAL VISITS TO FORTS CLARK, MANDAN AND UNION IN NORTH DAKOTA*

O. A. STEVENS

Plates 1025 and 1026

Through the enthusiastic assistance and guidance of my friend, Roy N. Bach, I was able to visit the site of Fort Mandan where Bradbury and Nuttall collected in 1810 and that of Fort Union where Audubon collected and illustrated birds and mammals in 1843. Maximilian was also at Fort Union in 1833. His artist,

* Contribution from the Department of Botany, North Dakota Agricultural Experiment Station, published with the permission of the Director.

Bodmer, gave us an excellent illustration of Fort Union and of the Indians, fortunately just before they were decimated by small pox.

Maximilian (1) gave us the best general account and Bodmer's classic illustrations are the best of the Indians of that time, but botanical contributions of this trip were few. Special interest attaches to Audubon's visit from the fact that he had engaged Isaac Sprague as assistant artist. Asa Gray soon discovered Sprague and for many years he was Gray's illustrator. The beautiful figures (unlabeled) of *Penstemon albidus*, *Echinacea angustifolia* and *Psoralea esculenta* in Audubon's birds (2) are undoubtedly Sprague's work. In other figures, one is more in doubt how much Audubon modified the work of his assistant. In another paper (3), I have discussed this further.

On June 21, 1945, we reached the site of Fort Union on the bank of the Missouri, about thirty rods east of the Montana State line. A tall flag pole was erected by the Great Northern Railway in 1935. The North Dakota Historical Society purchased the site in 1938 and has recently constructed a stone marker. A few posts stand to mark the walls but a gravel pit of recent date came near to destroying the site before the State intervened. Much of the material of the original fort was removed and used at Fort Buford a few miles farther east. Here the powder house still stands and the site is preserved.

I wanted to collect something from the fort-site. What would it be? Certainly not the too prevalent *Conringia* or *Descurainia Sophia*. I noted only one plant of *Penstemon albidus* and decided on a bit of *Sphaeralcea coccinea*, *Collomia linearis* and the latest arrival, *Camelina microcarpa*.

A mile or two farther east we found a road leading into the hills where Sprague and Audubon botanized. *Penstemon albidus* was still rare. *Psoralea esculenta* was fairly common and Mr. Bach found one plant with 13 racemes. *Echinacea* was just showing flower buds. *Astragalus pectinatus* was in full bloom and *A. bisulcatus* well begun. It seems strange that Audubon would not have mentioned these for they are striking. A few miles farther north we saw really breath-taking views of *A. bisulcatus*—great clumps dotting the small flats just below the foot of the buttes.

The afternoon was hot and we did not feel very ambitious. A creeping plant attracted my attention as we started down the hillside. It was *Phlox alyssifolia* (No. 818), which I had seen in the garden of J. Clayton Russell at Beach, North Dakota. He had found it about 30 miles over in Montana but we had not yet collected it in North Dakota. Here it seemed to have flowered only sparingly. On some hills farther north it was in better condition, with faded flowers and finally one fresh one, 25 mm. wide. Dr. E. T. Wherry writes me that there is a specimen of it from Fort Buford in the Britton Herbarium at the New York Botanical Garden, also one from "Phinney, N. D.," collected by C. Lockwood in 1898, in the Field Museum Herbarium. We have been unable to trace this locality.

Just before leaving the first hill, I was astonished to come upon *Astragalus Drummondii* (No. 817), new to North Dakota. The single plant had been half eaten off. A few miles farther north, we found one more plant and still farther, many plants, about seven miles south of U. S. Highway No. 2 and about 15 miles west of Williston. It looks so much like the prevalent *A. pectinatus* that one could hardly stop to examine each clump, and this may be why it had not been detected earlier.

On June 22, Audubon (4) had written (2: 52): "found a number of wild roses in bloom, quite sweet scented, though single and of a very pale rose color." It was June 23, when crossing the river at Elbowoods, we came suddenly on a bank of the first roses, *R. Woodsii*. My impression at first was that they were quite uniform in color and distinctly paler than our eastern *R. blanda*, but later we noticed various hues, more like the familiar "*arkansana*."

On August 7, 1938, we visited the site of the Indian village at Fort Clark. Here, also, the botanizing was disappointing. Behind the village-site was as pure a stand of *Bouteloua gracilis* as one could wish to see. The lodge-rings and most of the village-site were covered with *Agropyron Smithii* and a few weeds, especially *Lactuca scariola* and *L. pulchella*. Between the circles was a heavy growth of *Iva xanthifolia* and *Chenopodium*. Audubon (4) wrote of the camp being overrun with *Chenopodium album*, but it was doubtless *C. Berlandieri*. I finally collected a single plant of *Euphorbia glyptosperma*, large enough for seven



Site of Big HIDATSA VILLAGE just north of Knife River, near Stanton, N. D. Greater-like circles are lodge rings, with dark lines of weeds between. Bushes at lower left and upper right are *Shepherdia argentea*. Air photo by Roy N. Bach, 1941 (looking SE).



A detached clay butte on bank of Missouri River, above site of Fort Manuel Lisa and just below west end of proposed Garrison Dam. Formations and outwash from foot of butte in left foreground are very characteristic. *Opuntia* in grass and on small clay mounds at right. Single tree is probably *Fraxinus*, shrubs at left of it mostly *Shepherdia*. Shell at base of butte has such plants as *Chrysobalanus*, *Artemisia longifolia*, *Gutierrezia* and *Eriogonum multiceps*. Dark line toward top of butte is a thin lignite coal seam. Photo by Stanley Saugstad, 1941. Courtesy N. D. Game and Fish Dept.

specimens (No. 384). The site of the large Indian village just north of the Knife River was chiefly in a farmyard pasture. Here also, *Iva xanthifolia* was one of the most conspicuous plants. It is strange how the lodge-circles still show, especially as seen from the air (PLATE 1025).

Much confusion has attached to the location of these historic places, especially that of "Fort Mandan," so often mentioned by Nuttall and Bradbury. In discussing *Arnica fulgens*, Maguire (5) has enlarged upon Pennell's error (6) in assuming that the Fort Mandan of Nuttall was the same as that of Lewis and Clark. The latter structure was already partly destroyed when the party returned from the west coast and the site later was washed away by the river. A marker has been established by the North Dakota Historical Society on higher ground. This is on the east ("north" of the journals), bank about three miles north of the present railway station of Fort Clark, which is on the west side or eight miles south of the mouth (where it enters the flood-plain) of the Knife River.

The "Fort Mandan" of Nuttall and Bradbury was about an equal distance north of the Knife River on the west ("south") side of the Missouri. It is more correctly known as Fort Manuel Lisa, a trading and administrative post operated by that noted character. Truax (7) has given the best discussion of its location. Some maps show a town named Mannhaven, which was a river grain-elevator there. The bluffs between this place and the Knife River are high and steep. Northward, the river swings to the west, leaving a wide "bottom." The "fort" was located in a sort of amphitheater formed by the confluence of several short, deep "coulees" or ravines. The immediate bluffs are of the "Bad Land" butte type, presenting bare clay walls on the most exposed places, but the north and more gentle slopes are well covered with vegetation. The present plan seems to be to locate the west end of a huge dam across the river about three miles above the site. This may destroy the natural appearance of the place and cause great changes in flora.

Eriogonum flavum is quite a common plant on the hills. *E. multiceps*, described from Maximilian's collections, which is more closely restricted to eroded clay slopes, grew on the buttes at the site. *E. pauciflorum* is also attributed to the region, but so far, I

have failed to find it. *Astragalus tenellus*, which seems to inhabit gravelly clay, was abundant on one ridge, and *Thermopsis rhombifolia* grew nearby on the clay slope. *Hedysarum boreale*, which had been overlooked until recent years, grew on the slope which was covered with *Juniperus horizontalis* and herbaceous plants. *Erigeron glabellus* grew on the protected side at the foot of the buttes and part way up the slope. This appears to be the characteristic habitat for it. We did not observe var. *asper* along the river. Both were reported by Nuttall as flowering in August, but this must have been an error, or possibly based on late individuals, for June is the normal time.

I had hoped to make extensive topotype collections of the Upper Missouri River plants, but completion of the project is very dubious and it seems desirable to record the preceding notes and a few on some of the plants. On June 29, 1941, we tried to find the small stream where Bradbury had described (8) the lilies on June 24, 1810, forming a "scarlet stripe as far as the eye could see." If one were to ascend the river to this point and then climb the bluffs, he would be amazed to see the rugged hills soon give way to rolling, fertile farm-land. After considerable wandering by car, we found only one coulee which seemed to fit Bradbury's description. There were only a few lilies present, though the date was right for them.

I have been especially interested in *Lactuca ludoviciana*. All descriptions state that it has yellow flowers, but my conclusion is that it never did have such. In my first years of botanizing in eastern Kansas, I had called the flowers blue. We were a little too early at Fort Mandan for this plant. In the lily coulee were a few plants with the first flowers just open. Fortunately we were at the right time of day, for I have watched them at Fargo and found them open only from about 9 to 11 A. M. The rays were pale lilac as I have found them elsewhere. They may be nearly white or bluish. In dried specimens colors are notoriously misleading. I have noted *L. scariola* appearing bluish when dry.

Nuttall's lack of localities and his vague references to plants which ranged "to the northern Andes" have led to many speculations as to how far he might have gone. It seems more probable that he did not go far enough to see even the bluffs of the Little Missouri. It is not likely that he often crossed the Missouri

Maguire (5) (p. 425) suggested that Nuttall might have reached the White Earth vicinity for *Arnica fulgens*. This is neither necessary nor probable. In traveling along the Missouri in 1945, we did find it most abundant in the high, open coulees in Williams County, but it occurs southward through North Dakota and locally eastward to the central part of the State. In 1943, we were astonished to find it near McCanna (No. 683) in Grand Forks County. There is a specimen in the Brenckle Herbarium collected in western LaMoure County in 1903. I did not succeed in finding it there in 1944, but it easily may have been exterminated by breaking or pasturing of the prairie. Dr. Brenckle writes me that it disappeared soon after he collected it.

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POPULUS BALSAMIFERA OF LINNAEUS NOT A NOMEN AMBIGUUM

ERNEST ROULEAU

The binomial *Populus Tacamahacca* Miller has been generally accepted for the northern Balsam Poplar since Farwell published his note (8) on the nomenclature of *Populus balsamifera* Linnaeus. Sargent (36), Rehder (34), Redman (32, 33), Davy (6), Cansdale et al. (3) and Mansfeld (24) have also discussed the question and decided in favor of *Populus Tacamahacca* Mill. instead of *P. balsamifera* L., rejecting the latter as a *nomen ambiguum*. The major argument stressed by these authors for its rejection was the inferred basing of the Linnaean species upon a Catesby collection of *Populus deltoides* Bartram ex Marshall from Carolina. This opinion was not shared by House (12) and Valckenier-

Suringar (40). Houtzagers (14) has more recently re-examined the question but does not commit himself, accepting the names in use in recent manuals: *Populus Tacamahacca* for the Balsam Poplar and *P. deltoides* for the Cottonwood.

Moss (30) and Schinz & Thellung (37) have even gone so far as to reduce *Populus candicans* Ait. to the synonymy of *P. Tacamahacca* Mill. Farwell (8), following this conception, adopted the name *Populus Tacamahacca* var. *lanceolata* (Marshall) Farwell for our indigenous tree, so that the native Balsam Poplar has become a variety of a tree known in cultivation only. These authors have wrongly ascribed *Populus candicans* to the synonymy of *P. Tacamahacca*. Miller's original description (26) and figure (28) describe and illustrate staminate flowers: "The katkins are like those of the black Poplar, but the number of stamina in the male flowers is uncertain, from eighteen to twenty-two. The female flowers I have not fully examined, but by the male katkins I have been induced to place it in this genus". It is a recognized fact that *Populus candicans* Ait. is a cultivated tree, known only in the pistillate condition.

While preparing monographic studies in the section *Tacamahaca* of the genus *Populus* for North America, the author has had occasion to study this question.

Linnaeus' original description in *Species Plantarum* (16) was as follows:

- balsamifera* 4. POPULUS foliis subcordatis oblongis crenatis. *Hort. cliff.* 460. *Roy. lugdb.* 82.
Populus foliis cordatis crenatis basi nudis, petiolis tere-
tibus. Wach. ultr. 294.
Populus nigra, folio maximo, gemmis balsamum odoratis-
simum fundentibus. Catesb. car. I. p. 34, t. 34.
Populus foliis ovatis acutis serratis. Gmel. sib. I. p. 152.
t. 33.
Habitat in America septentrionali. h

It is worthwhile examining in detail each of the references given by Linnaeus.

1. HORT. CLIFF. 460 (15).

The description is as follows:

4. *Populus foliis cordatis crenatis.*
Populus nigra, folio maximo, gemmis balsamum odoratissimum fun-
dentibus. Catesb. ornith. 34, t. 34.

Crescit in Carolina Americes juxta aquas. Communicata ab Ill. Boerhaavio.

Cum etiamnum apud nos non floruerit, sexum determinare nequeo. Tam similis est antecedenti ac umquam affinis, differt foliis magis cordatis, obtusis, foliisque balsamo obunctis; inter stipulas liquidissimum balsamum maxima in copia datur.

Consequently, it is evident that Linnaeus' description was based upon a specimen communicated to him by Boerhaave. The only North American Poplar cultivated then in Holland was the Balsam Poplar, the "*Populus similis: Arbor: resinosa: altera*" of Boerhaave (2), based on Bauhin (1), the "*Tacamahaca foliis crenatis*" of Hermann (10) and Plukenet (31). The descriptions of these pre-Linnaean authors refer to trees cultivated in Holland, at Leyden mostly. The references given by these authors to Monardes (29) and Hernandez (11) are based on the analogy of the resinous gum of the buds of the Balsam Poplar with the gum of *Bursera Simaruba* (L.) Sarg. or some allied species, known in Mexico and Central America as "*tacamahaca*" or "*tacamaco*". Many other plants received the name of "*tacamahaca*" for the same reason.

It should be noted that Linnaeus in his *Species Plantarum* does not limit the distribution of *Populus balsamifera* to Carolina (apparently taken from Catesby) but extends it to "*America septentrionali*".

Wein (43) gives an interesting discussion of the important question of the introduction of American trees into Europe.

Whether there is a specimen of this species in the herbarium of Clifford is not known to the author, though there is a TYPE-SPECIMEN in the personal herbarium of Linnaeus, which seems to have been generally overlooked. It was there when he was writing his *Species Plantarum* and bears his annotation "*4. balsamifera*". It is of a short shoot consisting of six leaves with rounded bases, two of which have the base a little subcordate and asymmetrical. This type matches very easily numerous collections of *Populus balsamifera* made in Canada and the United States. One will find an illustration of the type and a letter of Jackson attesting the authenticity of the type-specimen in Houtzagers (14). The Catesby reference will be discussed later.

2. ROY. LUGDB. 82 (35).

Royen only repeats the "specific name" found in Linnaeus' Hortus Cliffortianus and in Catesby's Natural History of Carolina.

3. WACH. ULTR. 294 (41).

4. *Populus foliis cordatis, crenatis; basi nudis; petiolis teretibus.*
Populus foliis cordatis, crenatis. Linn. hort.

This description can apply only to the Balsam Poplar, the "petiolis teretibus" and "basi nudis" leaving little doubt.

4. CATESB. CAR. I, p. 34, t. 34 (4).

Populus nigra, folio maximo, gemmis Balsamum odoratissimum fundentibus.

THE BLACK POPLAR of Carolina.

THIS Tree grows only near rivers, above the inhabited parts of Carolina. They are large and very tall. In April, at which time only I saw them, they had dropt their seeds; which, by the remains, I could only perceive to hang in clusters, with a cotton-like consistence covering them. Upon the large swelling buds of this Tree sticks a very odoriferous balsam. The leaves are indented about the edges, and very broad, resembling in shape the black Poplar, described by Parkinson.

Catesby's plate shows a vigorous shoot the leaves of which are truly cordate and toothed down to the junction of blade and petiole. The petioles, moreover, have at their junction with the blade a very strong rounded appearance. It may be safely assumed that it is a rather poor illustration of *Populus heterophylla* L. The unreliable characters of Catesby's plate enumerated above were certainly sufficient to mislead Linnaeus as to its identity, and to make him think it represented a vigorous shoot of the Balsam Poplar. Specimens of *Populus heterophylla* in the Gray Herbarium match perfectly Catesby's plate (*i. e.* the long shoots).

Catesby's specimen preserved in the British Museum has little to do with his illustration. It is a well developed short shoot of *Populus deltoides* (certainly not collected in April) with deltoid leaves and crenate teeth which begin at a comparatively long distance from the junction of blade and petiole (as is the case in the section *Aigeiros*).

From Catesby's description, supplemented by a more detailed one (5) wherein he states "Its leaves are large, smooth on one

side . . . The foot-stalks are long, remarkably flat, and of a reddish colour, as are the larger veins of the leaves . . . ", it is evident that the plate and the specimen in the British Museum represent two different species. The plate represents *Populus heterophylla* and the description is a mixture of characters of *Populus heterophylla* and *P. deltoides*. Linnaeus seems to have relied more on the plate than on the description.

5. GMEL. SIB. I, P. 152, t. 33 (9).

This reference to Gmelin is to a Poplar of section *Tacamahaca* which has been later segregated as *Populus suaveolens* Fischer.

Through the "doctrine of residues", we must keep the name *Populus balsamifera* for the major element included by Linnaeus in his description, *i. e.* the common American Balsam Poplar of which there is a type specimen in the Linnaean herbarium. This name (excl. syn. Catesby and Gmelin) should be reinstated for the tree which for the last quarter of a century has been passing as *Populus Tacamahacca* Miller.

Supplementary references or notes given by Linnaeus in literature subsequent to the *Species Plantarum* make even clearer what tree he was describing.

In his *Systema Naturae*, eds. 10 and 11 (19, 20), the description is as follows:

balsamifera 4. P. fol. ovatis crenatis. Duham. arb. 2. t. 182. f. 6. Trew. ehret. t. 46.

Linnaeus changes his "specific name". The adjective *ovatis* is more in harmony with the short-shoot leaves of *Populus balsamifera*. The reference to Duhamel's figure (7) is to that of a leaf of the American Balsam Poplar. Similarly, the reference to Trew (39) leads to a handsome colored plate of the American Balsam Poplar.

Again in his *Systema Naturae*, eds. 12 and 13 (21, 22), Linnaeus gives the following description:

balsamifera 4. P. fol. ovatis serratis subtus albidis, stipulis resinosis. *Populus foliis subcordatis inferne incanis, superne atroviridibus. Mill. dict.* 7. *Tacamahaca foliis crenatis. Pluk. alm.* 360. t. 281. f. 2. *Mill. dict. app. Trew Ehret. t.* 46. *Folia ovato-oblonga, subtus alba superficie vix conspicue tomentosa venis nudis reticulata.*

It is very interesting to note that here Linnaeus himself cites Miller (25). In the eighth edition of his *Gardener's Dictionary* (where binomial nomenclature was adopted, at least in part), Miller repeats the same diagnosis for *Populus Tacamahacca* as the one given in the seventh edition (*i. e.* the reference given by Linnaeus). His more detailed English description differs only in phrasing from that given in the earlier edition. The other references have already been discussed.

Finally, in *Species Plantarum* eds. 2 and 3 (17, 18), we read:

- balsamifera* 4. *POPULUS* foliis subcordatis denticulatis. *Hort. cliff.* 460. *Roy. lugdb.* 82.
Populus foliis cordatis crenatis basi nudis, petiolis teretibus. *Wach. ultr.* 294.
Populus nigra, folio maximo gemmis balsamum odoratissimum fundentibus. *Catesb. car.* I. p. 34. t. 34. *Duham. arb.* 2. p. 178. t. 38. f. 6.
Populus foliis ovatis acutis serratis. *Gmel. sib.* I. p. 152. t. 33.
Habitat in America septentrionali. ♀

The "specific name" is again changed. The synonyms given are the same as those listed in *Species Plantarum* (ed. 1). The only addition is a reference to Duhamel which follows the one to Catesby. This indicates very well that Linnaeus believed Catesby's plate to represent the Balsam Poplar. Duhamel's description (7) leaves absolutely no doubt:

. . . mais il n'y en a point qui en répande autant, & d'une aussi agréable odeur, que celui de l'espece à feuilles ovales, no. 6, qu'on nomme pour cette raison *Baumier*.

Je n'en ai jamais vu de grand, ses feuilles sont ovales, plus larges du côté de la queue qu'à l'extrémité, terminées en pointe, dentelées finement par les bords, vertes en dessus, d'un blanc un peu jaunâtre par dessous.

More evidence can be found in other authors. Thomas Martyn (27), who re-edited the *Gardener's Dictionary* of Miller, adds *Populus Tacamahacca* Mill. to the synonymy of *Populus balsamifera* L. for the following reason: "Mr. Miller's figure and description agrees with the American Tacamahaca as it appears in our gardens". Miller's plate (28), also reproduced in the ninth edition (27) of the *Gardener's Dictionary*, is a better-than-average illustration of the American Balsam Poplar. Willdenow (44) adds two post-Linnaean references: first to Wangenheim (42), whose illustration represents a short-shoot leaf of *Populus bal-*

samifera; second, to Houttuyn (13), who describes the North American Balsam Poplar. Other authors of this period (such as Muenchhausen, DuRoi, Burgsdorff and others) only repeat the references given by Linnaeus (including Catesby and Gmelin) in his works published after *Species Plantarum* (ed. 1).

From the above notes one can see that the citation by recent authors of *Populus balsamifera* Muenchhausen, DuRoi or Auct., not Linnaeus, as identical with *Populus Tacamahacca* Miller, is in reality *Populus balsamifera* Linnaeus sensu Linnaeus down to Farwell, Sargent, Rehder, etc., who rejected it as a *nomen ambiguum*. The assertion by only a few botanists that a Linnaean name is an ambiguous name or that it has been variously applied is not a sufficient reason for rejecting it.

The name *Populus balsamifera* L. (excl. syn. Catesby and Gmelin) which was correctly accepted and understood by most dendrologists (Loudon, Spach, Wesmael, Koch, Schneider, Henry, etc.) must be kept for the American Balsam Poplar.

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INSTITUT BOTANIQUE, UNIVERSITÉ DE MONTRÉAL.

SIZE, SHAPE AND NUMBER OF *ASTRAGALUS CARYOCARPUS* FRUITS.—This species seemed to bloom in unusual profusion in the spring of 1945 and I noted much variation in color of flowers, from dark purple to pinkish and bluish hues. Fruits were produced in abundance and their apparent variation in shape suggested a study of them. Collections were made at two places in northern Richland County, North Dakota, July 7, and in Clay County, Minnesota, July 13. From July 18 to 21, collections were made in Morton and Slope Counties, North Dakota. In each case, 10 or more fruits were taken from 15 to 20 individual plants and carefully measured while fresh. The following table summarizes the results.

Place	No. of plants	Aver.	Length		Aver.	Average ratio, length-width	
			Max.	Min.		Max.	Min.
Leonard, N. D., 1	18	2.0	2.2	1.8	1.01	1.09	.91
Leonard, N. D., 2	24	2.0	2.3	1.5	1.05	1.15	.97
Muskoda, Minn.	15	2.0	2.2	1.9	1.01	1.09	.96
Mandan, N. D.	22	2.0	2.2	1.9	1.00	1.06	.96
Amidon, N. D.	15	1.8	2.0	1.7	.89	.91	.85

The specimens from Slope County seem to run a trifle shorter than the others but the difference is scarcely significant. The general trend is clear and the variation less than I had expected. The fruits are just about 2 cm. long, varying only from slightly longer than wide to the reverse. Thickness was measured for only a few and it seemed rather uniform, about three-fourths of the width.

Gray's Manual describes the fruits as "ovoid-globular, more or less pointed." This is certainly not true of our material. The usual outline is quadrate, occasionally slightly obovoid. Sometimes there is a distinct mucronation from the style-base, but more often only a faint point.

A large plant on a roadside cut in Emmons County, had an expanse of fully a meter and bore 163 fruits. Smaller plants found later were even more prolific. We wondered whether size of fruit might be related to number, but counts indicated this was not true. The usual number per main stem was only 1 to 5, but occasionally reached 15 or 20 on an individual stem. Three plants in Slope County bore 93, 110 and 124 fruits respectively, the last a plant with an expanse of about 3 dm.—O. A. STEVENS, North Dakota Agricultural College, Fargo, North Dakota.

SPIRAEA LATIFOLIA VAR. *SEPTENTRIONALIS* IN VIRGINIA.—On September 9, 1945, in company with Bernice M. Speese and Earlene Atchison, the writer collected *Spiraea latifolia* (Ait.) Borkh., var. *septentrionalis* Fernald on the very top of Hawksbill Mountain (elevation of 4049 feet), Page County, Virginia. There a small but dense patch grew in soil among the rocks. Some of the plants were in flower; others were in fruit.

Specimens are in the Gray Herbarium (*Baldwin 5464*). They were identified by Prof. M. L. Fernald, who wrote in a letter of October 16, 1945: "This variety occurs on the Labrador Peninsula and in Newfoundland and south to the Magdalen Islands and subalpine and alpine regions of Mt. Katahdin, Maine, and the White Mountains, New Hampshire, also on Keweenaw Peninsula, Michigan. It is distinguished from true *S. latifolia* by the dense cylindric to ovoid panicles, without elongate lower branches, and the relatively large flowers. It is a nice addition to the mountain-flora of northern Virginia."—J. T. BALDWIN, JR., The Blandy Experimental Farm, Boyce, Virginia.

HELIANTHUS—A CORRECTION.—In a recent discussion of the confusion which has prevailed regarding certain species of *Helianthus* I became acutely infected by the germ of confusion and incorrectly cited, on page 79 of the April number of *RHODORA*, *H. rigidus*, forma *flavus* in the synonymy of *H. laetiflorus*, var. *rigidus*. *H. rigidus*, forma *flavus* = typical *H. laetiflorus* (with yellow disk).—M. L. FERNALD.

Volume 48, no. 568, containing pages 65-88 and plates 1011-1020, was issued 8 April, 1946.

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